

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**Applicant(s):** Cyril Cabral, Jr., et al.      **Examiner:** Unassigned  
**Serial No:** Unassigned      **Art Unit:** Unassigned  
**Filed:** Herewith      **Docket:** YOR919990509US3 (13171AB)  
**For:** METHOD AND STRUCTURE      **Date:** April 19, 2004  
FOR REDUCTION OF CONTACT  
RESISTANCE OF METAL SILICIDES  
USING A METAL-GERMANIUM ALLOY

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**INFORMATION DISCLOSURE STATEMENT**

Sir:

In accordance with 37 C.F.R. §§1.56, 1.97 and 1.98, it is respectfully requested that the following references, which are also listed on the attached form PTO-1449, be made of record in the above-identified patent application.

1. U.S. Patent No. 5,510,295, dated April 23, 1996, issued to Cabral Jr., et al.;
2. U.S. Patent No. 5,608,226, dated March 4, 1997, issued to Yamada, et al.;

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I hereby certify that this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. §1.10 on the date indicated above and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Dated: April 19, 2004

  
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Leslie S. Szivos, Ph.D.

3. U.S. Patent No. 5,624,869, dated April 29, 1997, issued to Agnello, et al.;
4. U.S. Patent No. 5,828,131, dated October 27, 1998, issued to Cabral, Jr., et al.
5. U.S. Patent No. 5,830,775, dated November, 1998, issued to Maa, et al.
6. U.S. Patent No. 5,710,450, dated January, 1998, issued to Chau, et al.
7. U.S. Patent No. 6,121,100, dated September, 2000, issued to Andideh, et al.
8. U.S. Patent No. 6,165,826, dated December, 2000, issued to Chau, et al.
9. U.S. Patent No. 6,211,560 B1, dated April, 2001, issued to Jimenez, et al.
10. U.S. Patent No. 6,326,664 B1, dated December, 2001, issued to Chau, et al.
11. U.S. Patent No. 4,965,645 A, dated October, 1990, issued to Solomon.
12. U.S. Patent No. 5,336,903 A, dated August, 1994, issued to Ozturk, et al.
13. U.S. Patent No. 5,401,674 A, dated March, 1995, issued to Anjum, et al.
14. M. Lawrence, et al., "Growth of Epitaxial  $\text{CoSi}_2$  on (100) Si," *Appl. Phys. Lett.*, Vol. 58, No. 12, pp. 1308-1310 (1991).
15. C. Cabral, et al., "In-Situ X-Ray Diffractin and Resistivity Analysis of  $\text{CoSi}_2$  Phase Formation With and Without a Ti Interlayer at Rapid Thermal Annealing Rates," *Mat. Res. Soc. Symp. Proc.*, Vol. 375, pp. 253-258 (1995).
16. Wolf, *Silicon Processing for the VLSI Era*, Vol. 2-Process Integration, Lattice Press: Sunset Beach CA, 1990, pp. 144-151.
17. Huang, et al. "Impact of Ge implantation on the electrical characteristics of  $\text{TiSi}_2$  p+n shallow junctions with an a-Si (or poly-

Si) buffer layer" in IEEE Transactions on Electron Devices, 44(4), April 1997, pp. 601-606.

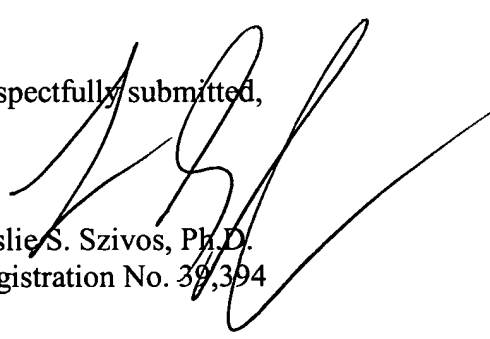
18. Prabhakaran, et al. "Diffusion mediated chemical reaction in Co/Ge/Si(100) forming Ge/CoSi<sub>2</sub>/Si(100)" in Applied Physics Letters 68(9), 26 February 1996, pp. 1241-1243.

Pursuant to 37 C.F.R. §1.98(d), copies of the above listed references are not provided, as the references were previously submitted to the Examiner or cited by the Examiner in connection with parent case, Serial No. 09/519,897 filed April 6, 2000 and divisional application Serial No. 09/994,954 filed November 27, 2001.

Consideration of this Information Disclosure Statement is respectfully requested, since the information provided herewith may be material to the examination of the present application as defined under 37 C.F.R. §1.56. This statement is not intended to represent that a search has been performed or that no other art than that identified herein exists.

The instant Information Disclosure Statement is being submitted concurrent with the filing of the present application. Therefore, this filing is made under 37 C.F.R. §1.97(b)(1). An Information Disclosure Statement filed under 37 C.F.R. §1.97(b)(1) requires neither certification nor fee.

Respectfully submitted,

  
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<b>INFORMATION DISCLOSURE CITATION</b> (Use several sheets if necessary)	Docket Number (Optional) YOR919990509US3 (13171AB)	Application Number Unassigned
	Applicant(s) Cyril Cabral, Jr., et al.	
	Filing Date Herewith	Group Art Unit Unassigned

**U.S. PATENT DOCUMENTS**

*EXAMINER INITIAL	REF	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		5,510,295	4/23/96	Cabral, Jr., et al.			
		5,608,226	3/4/97	Yamada, et al.			
		5,624,869	4/29/97	Agnello, et al.			
		5,828,131	10/27/98	Cabral, Jr., et al.			
		5,830,775	11/1998	Maa, et al.			
		5,710,450	1/1998	Chau, et al.			
		6,121,100	9/2000	Andideh, et al.			
		6,165,826	12/2000	Chau, et al.			
		6,211,560 B1	4/2001	Jimenez, et al.			
		6,326,664 B1	12/2001	Chau, et al.			

**FOREIGN PATENT DOCUMENTS**

REF	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO

**OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)**

		M. Lawrence, et al., "Growth of Epitaxial CoSi <sub>2</sub> on (100) Si, "Appl. Phys. Lett., Vol. 58, No. 12, pp. 1308-1310 (1991).
		Wolf, Silicon Processing for the VLSI Era, Vol. 2-Process Intergration, Lattice Press: Sunset Beach CA, 1990, pp. 144-151.
		C. Cabral, et al., "In-Situ X-Ray Diffractin and Resistivity Analysis of CoSi <sub>2</sub> Phase Formation With and Without a Ti Interlayer at Rapid Thermal Annealing Rates, "Mat. Res. Soc. Symp. Proc., Vol. 375, pp. 253-258 (1995).

EXAMINER	DATE CONSIDERED
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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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		5,336,903 A	8/1994	Ozturk, et al.				
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		Huang, et al. "Impact of Ge implantation on the electrical characteristics of TiSi2 p+n shallow junctions with an a-Si (or poly-Si) buffer layer" in IEEE Transactions on Electron Devices, 44(4), April 1997, pp. 601-606.						
		Prabhakaran, et al. "Diffusion mediated chemical reaction in Co/Ge/Si(100) forming Ge/CoSi2/Si(100)" in Applied Physics Letters 68(9), 26 February 1996, pp. 1241-1243.						
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